

Cambio, WESPA, GSG

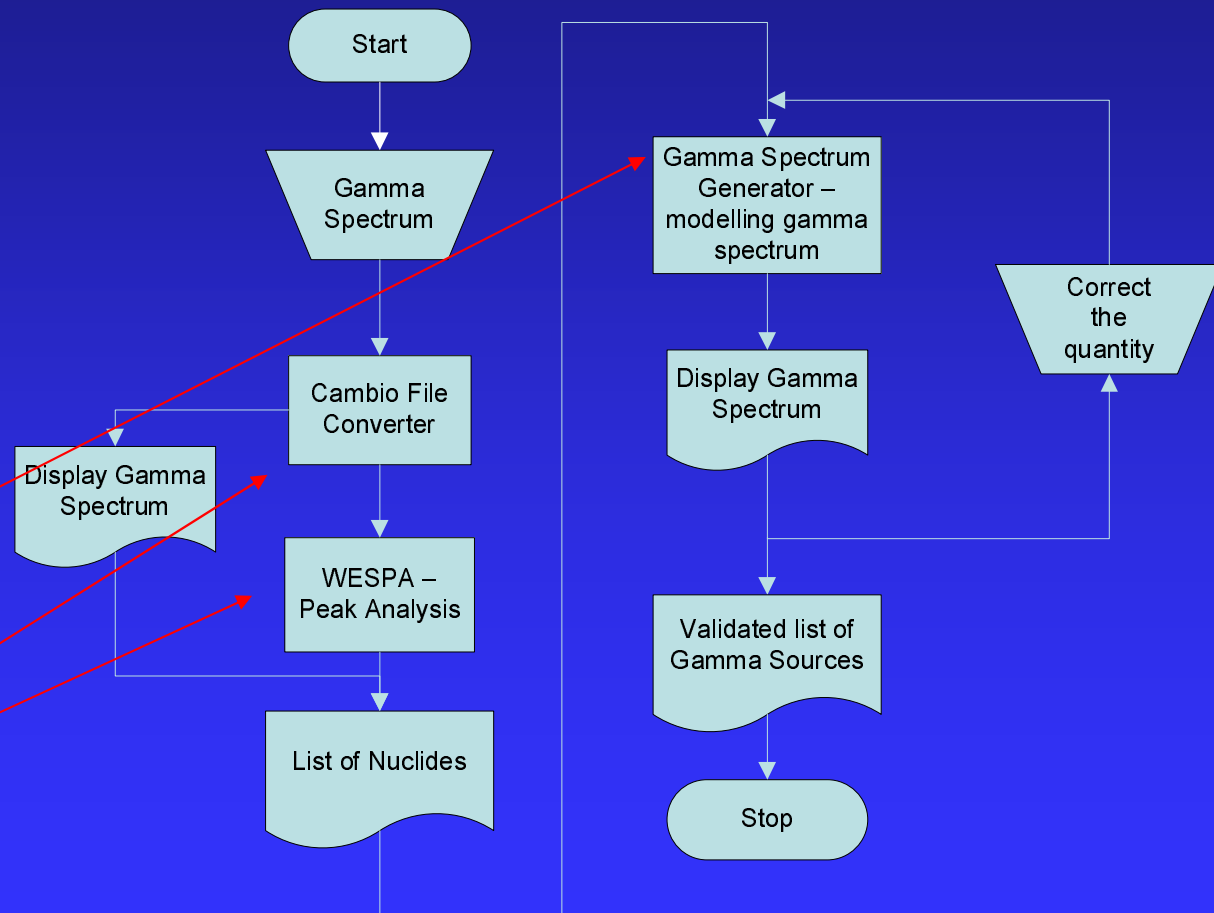
Combination of Nucleonica
modules

Zs. Soti, J. Magill, R. Dreher

Case study

➤ Application Centre

- » Mass Activity Calculator
- » Decay Engine
- » Dosimetry & Shielding
- » Range & Stopping Power
- » In Silico Dosimetry
- » webKORIGEN
- » Decay Engine for Large Nuclide Sets
- » Universal Nuclide Chart
- » Transport & Packaging
- » Nuclide mixtures
- » Nucleonica Scripting
- » Gamma Spectrum Generator
- » Gamma Spectrum Generator Pro
- » Photon Interaction with Matter
- » easy Monte Carlo
- » Cambio file Converter
- » WESPA
- » Gamma Library
- » webGraph



Cambio

- G. Lasche has developed
- Read and display spectral data of different detector systems (more than 50 file formats)
- Convert spectrum to another 7 commercial formats – transfer spectral data between different analysis tools
- Compare different gamma spectra

Cambio – Convert, Display, Compare

Convert a file | Spectrum | Spectral Data | Sample Spectra | Diagnostics | About Cambio

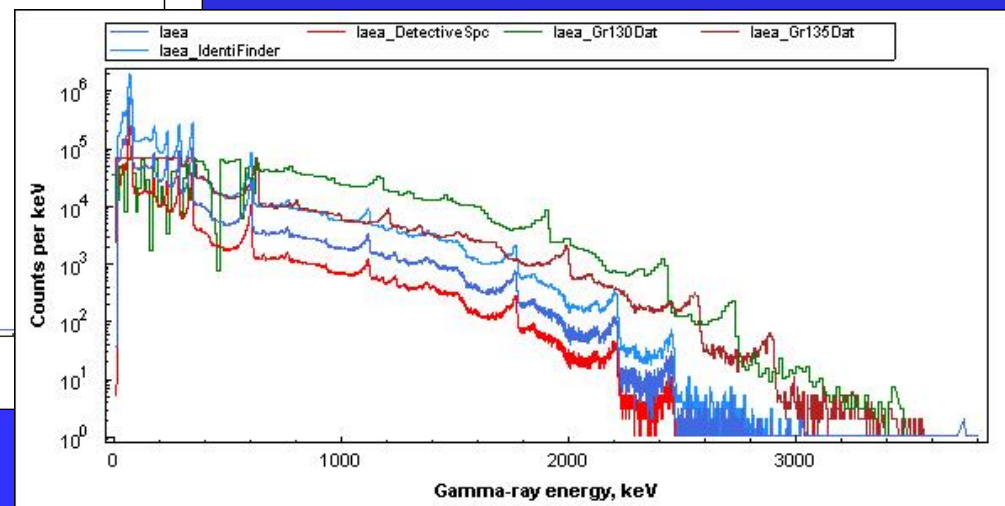
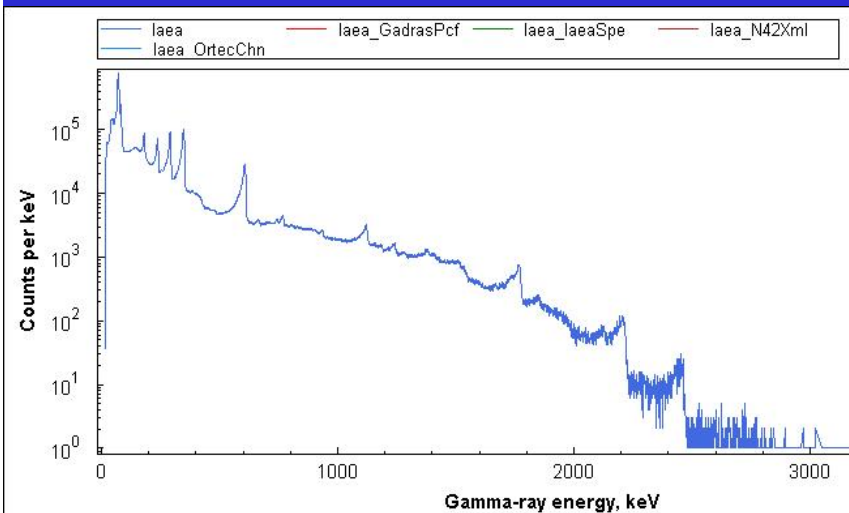
Step 1
Please select a file to be converted

Step 2
Please upload the selected file

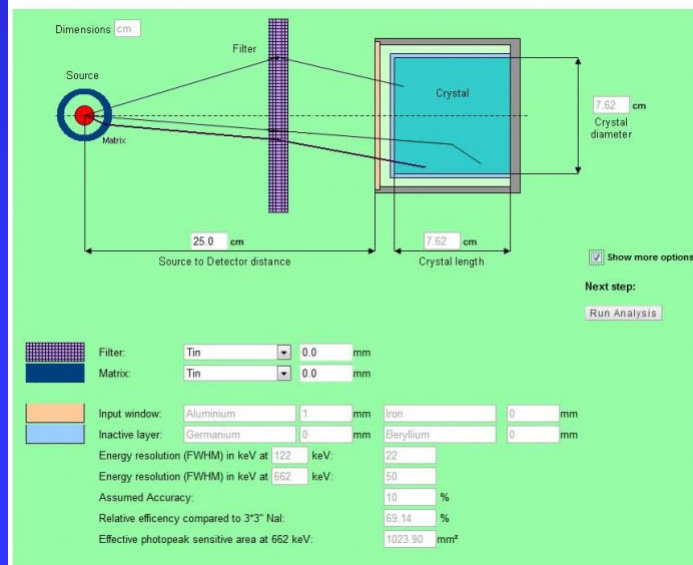
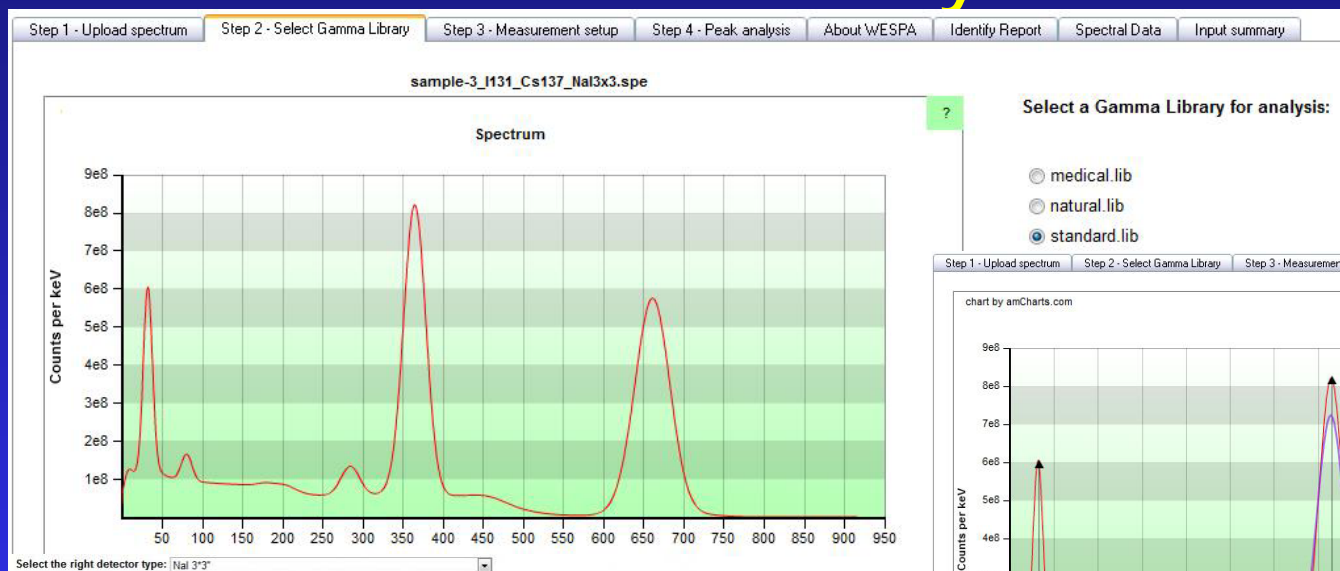
Step 3
Choose the format to convert to (instrument / 3rd party software)

Step 4
Convert the file using Cambio

Step 5
Download the converted file

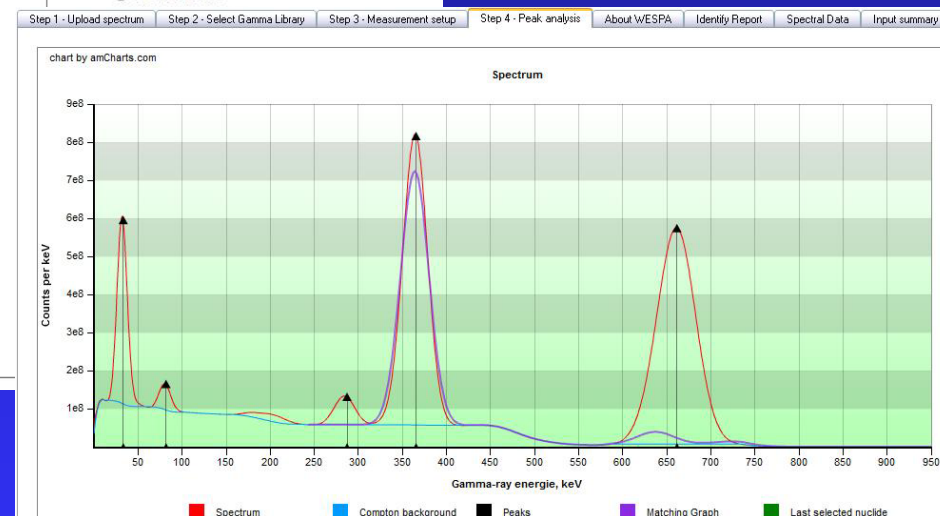


WESPA – Web based Spectrum Analyser



Select a Gamma Library for analysis:

- ☐ medical.lib
- ☐ natural.lib
- ☒ standard.lib



Reset Gamma ray energie, keV: 365.39 Counts: 685274752 ☒ Logarithmic scale

Detected peaks. Select an energy peak to obtain the list of proposed nuclides.

Energy	Channel	FWHM	Area	Assigned nuclide
33.14	33	13.2875	6.959257E+09	
81.8	81	15.10887	1.09576E+09	
287.18	287	0	2.119376E+09	
365.39	366	32.45459	2.639001E+10	I 131
661.52	662	50.85828	3.085853E+10	

Nuclide proposal. Select a nuclide and show own spectrum

Nuclide	Energy from Library
Pa231	357.27
Pd103	357.45
Cf252	359.63
I 131	364.48
Eu152	367.79
Am241	368.59
Bi210	369.4
Pu241	370.91

No selection

Add nuclide spectrum to the Matching Graph

Gamma Spectrum Generator

An arbitrary individual nuclide or a pre-defined mixture of nuclides can be selected as a radiation source

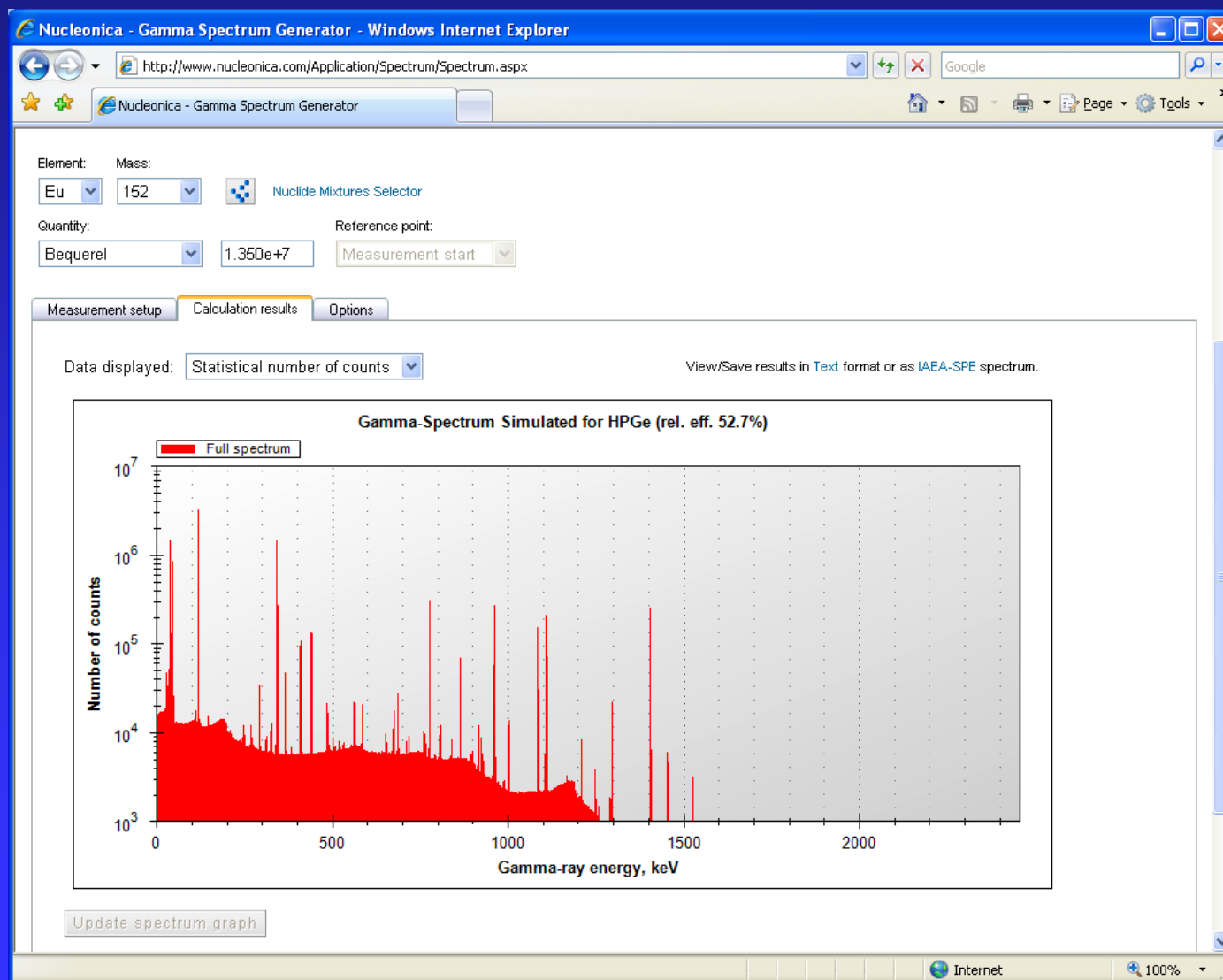
The quantity (activity, mass or number of atoms) of a nuclide or a mixture can be specified either at the moment of its production or at the spectrum measurement starting point of time. In the former case controls for specifying duration of a source cooling time interval become available.

The screenshot shows the 'Gamma Spectrum Generator' web application running in a Windows Internet Explorer browser. The application is titled 'Nucleonica - Gamma Spectrum Generator' and the URL is 'http://localhost:1652/WebSite1/Application/Spectrum.aspx'. The main content area displays 'Eu152' (63 Europium) with a half-life of 12.353 years. Below this, there are input fields for 'Element' (Eu), 'Mass' (152), and 'Quantity' (Bequerel, 1.350e+7). A 'Reference point' dropdown is set to 'Nuclide creation', and a 'Cooling time' field is set to 5 years. The 'Measurement setup' tab is active, showing a 'Measurement time' of 1000 seconds and 'Start' and 'Start in background' buttons. A 'Current configuration' dropdown is set to 'HPGe, p-type, coaxial, Canberra GC-6020, rel. eff. 60%'. Below this is a diagram of the detector setup showing a 'Source' at a distance of 170.0 mm from a 'Filter', which is in front of a 'Crystal' (HPGe). The crystal has a diameter of 72.2 mm, a contact diameter of 10.0 mm, and a contact length of 36 mm. The crystal length is 52 mm. A 'Show more settings' checkbox is at the bottom right of the diagram.

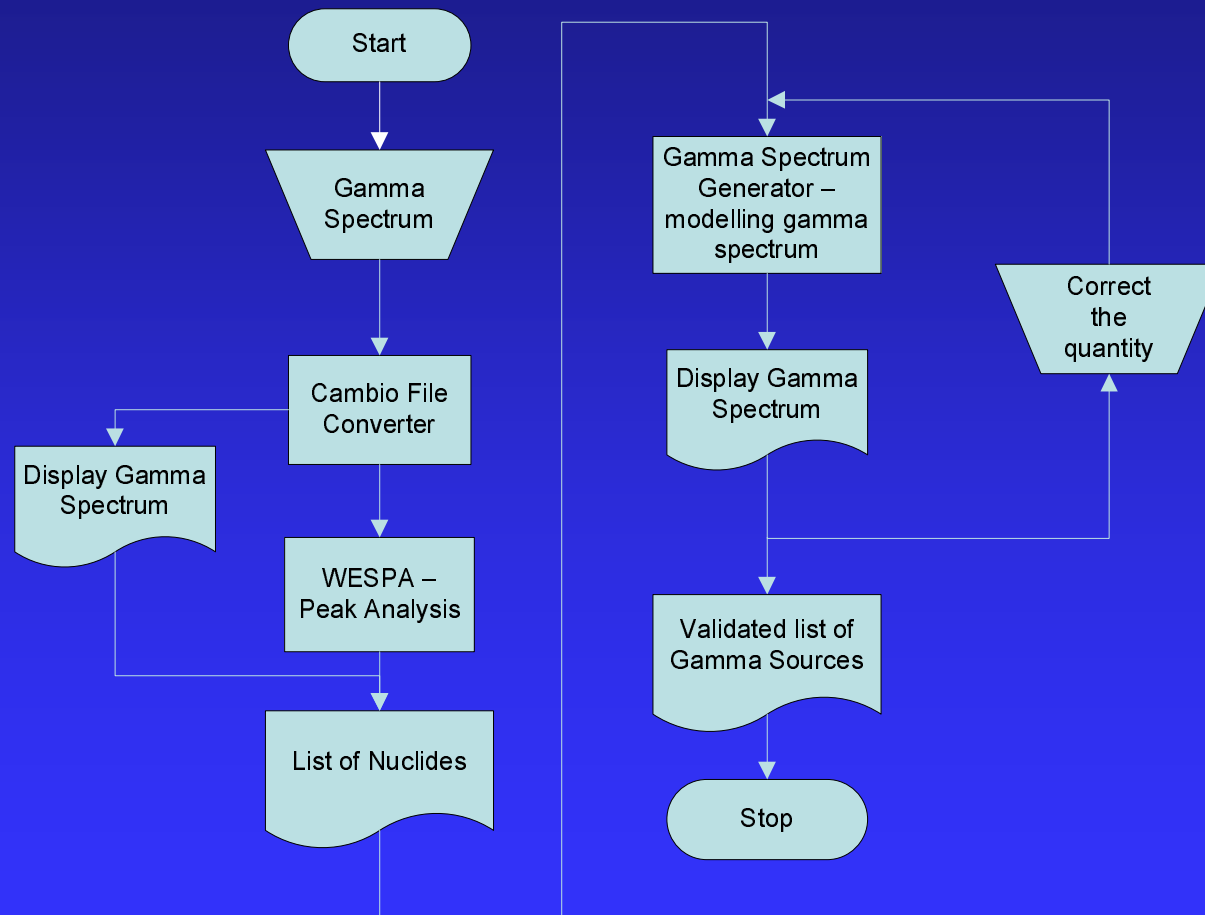
Calculations can be started on-line or in a background mode

A suitable γ -spectrometer can be chosen from 6 pre-defined configurations, which include 2 coaxial HPGe (50% and 150%) detectors, low-energy (LEGe) and broad-energy (BEGe) HPGe detectors, and 2 NaI detectors ($\varnothing 3'' \times 3''$ and $\varnothing 2'' \times 1''$). In addition, user's specific configurations can be managed.

GSG



Case study



Cambio: Convert the spectrum file from format CNF to SPE

Nucleonica - Cambio file Converter - Windows Internet Explorer

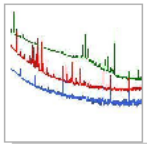
http://www.nucleonica.com/Application/Cambio/Cambio.aspx

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Version: 2011.07.12 16:36:06

 **Cambio File Converter**

Cambio was developed in response to a need of nuclear emergency response analysts everywhere to be able to quickly read the data from any of a widely growing number of formats used by both commercial and government detector systems worldwide. As the number of manufacturers of nuclear detection instrumentation grows, so does the number of data formats that must be able to be read by emergency analysts. Manufacturers of instrumentation often need to create new and more complex versions of their own formats as technology advances and as new user requirements lead to new, more sophisticated instruments.

Questions, remarks, suggestions can be posted in the forum

Convert a file Spectrum Spectral Data Sample Spectra Diagnostics About Cambio

Step 1
Please select a file to be converted

Step 2
Please upload the selected file

Step 3
Choose the format to convert to (instrument / 3rd party software)
laeaSpe

Step 4
Convert the file using Cambio

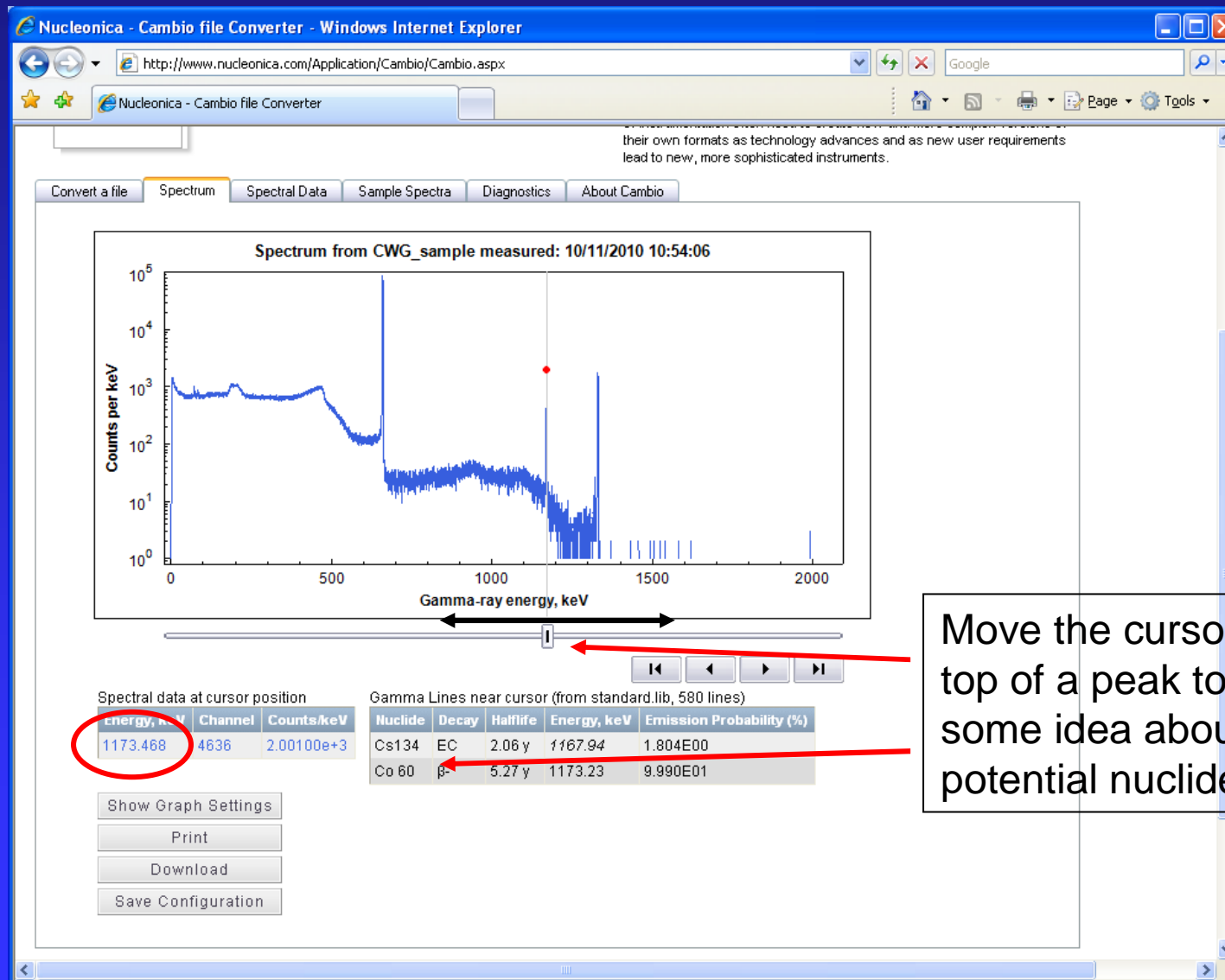
Step 5
Download the converted file

Uploaded file: D:\User-DATA\Presentations\Trainings\Monaco_2011\CWG_sample.CNF

Converted file: CWG_sample.spe

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Cambio: Display spectrum



WESPA: Analyse the spectrum

Nucleonica - WESPA - Windows Internet Explorer

http://www.nucleonica.com/Application/WESPA/WESPA.aspx

Google

Nucleonica - WESPA

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Questions, remarks, suggestions can be posted in the forum Version: 2011.07.12 16:3

Web-based Gamma Spectrum Analyser - WESPA

Step 1 - Upload spectrum Step 2 - Select Gamma Library Step 3 - Measurement setup Step 4 - Peak analysis About WESPA Identify Report Spectral Data Input summary

Select a sample spectrum for analysis:

- ☒ sample-1_Co60_NaI3x3.spe
- ☐ sample-2-Cs137_Na3x3.spe
- ☐ sample-3_I131-Cs137_NaI3x3.spe
- ☐ sample-4_Ba133_HPGe.spe
- ☐ sample-5_Eu152_HPGe.spe

Next step:

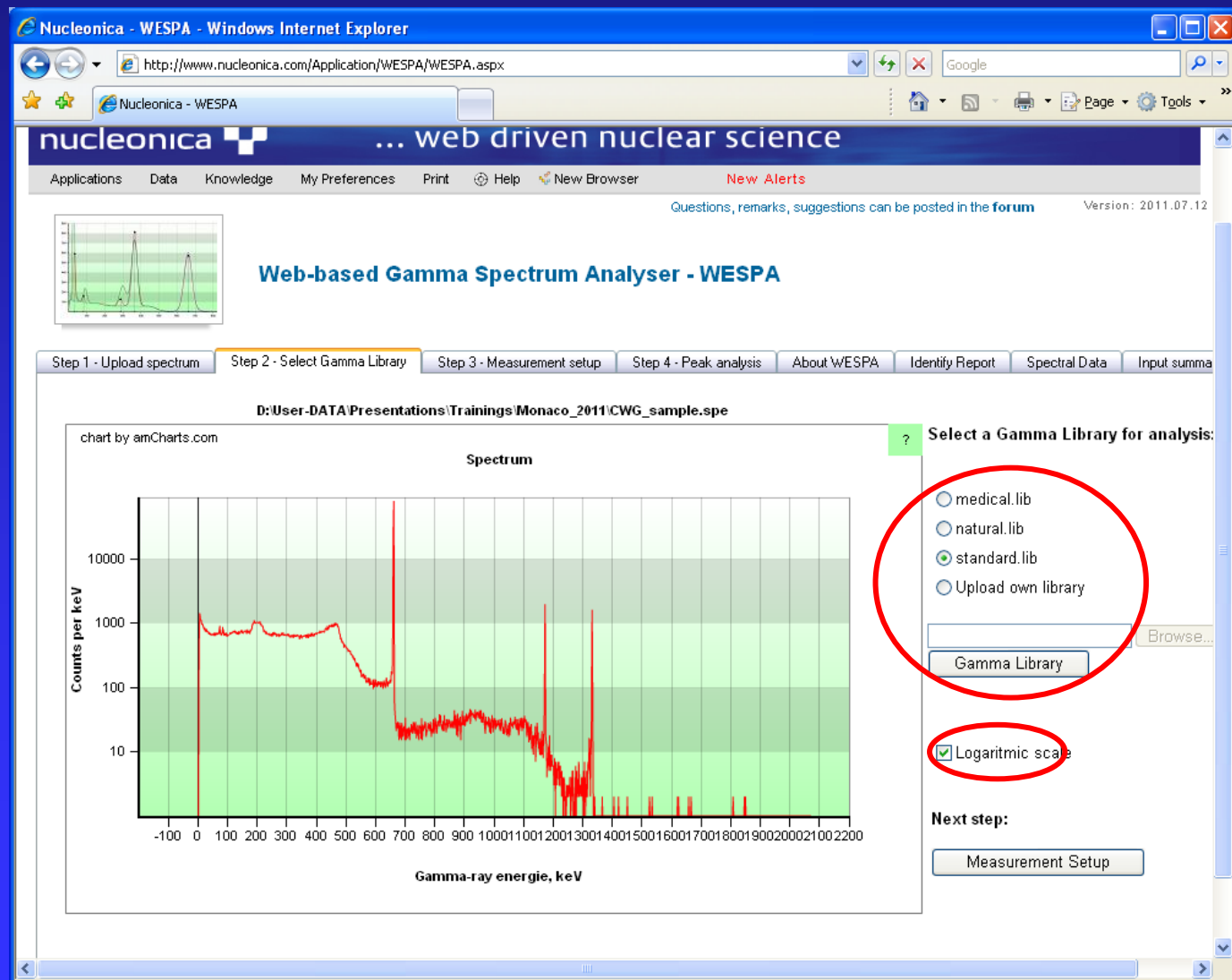
Display sample

OR

Upload an input spectrum:

Browse... File format

WESPA: Display



WESPA: Measurement setup

Nucleonica - WESPA - Windows Internet Explorer

http://www.nucleonica.com/Application/WESPA/WESPA.aspx

Step 1 - Upload spectrum Step 2 - Select Gamma Library Step 3 - Measurement setup Step 4 - Peak analysis About WESPA Identify Report Spectral Data Input summary

Select the right detector type: HPGe rel eff 50%

Dimensions cm

Source

Matrix

Filter

Crystal

Crystal diameter: 5.90 cm

Source to Detector distance: 25.0 cm

Crystal length: 7 cm

☒ Show more options

Next step: Run Analysis

Filter: Tin 0.0 mm

Matrix: Tin 0.0 mm

Input window: Aluminium 0.5 mm Iron 0 mm

Inactive layer: Germanium 0.5 mm Beryllium 0 mm

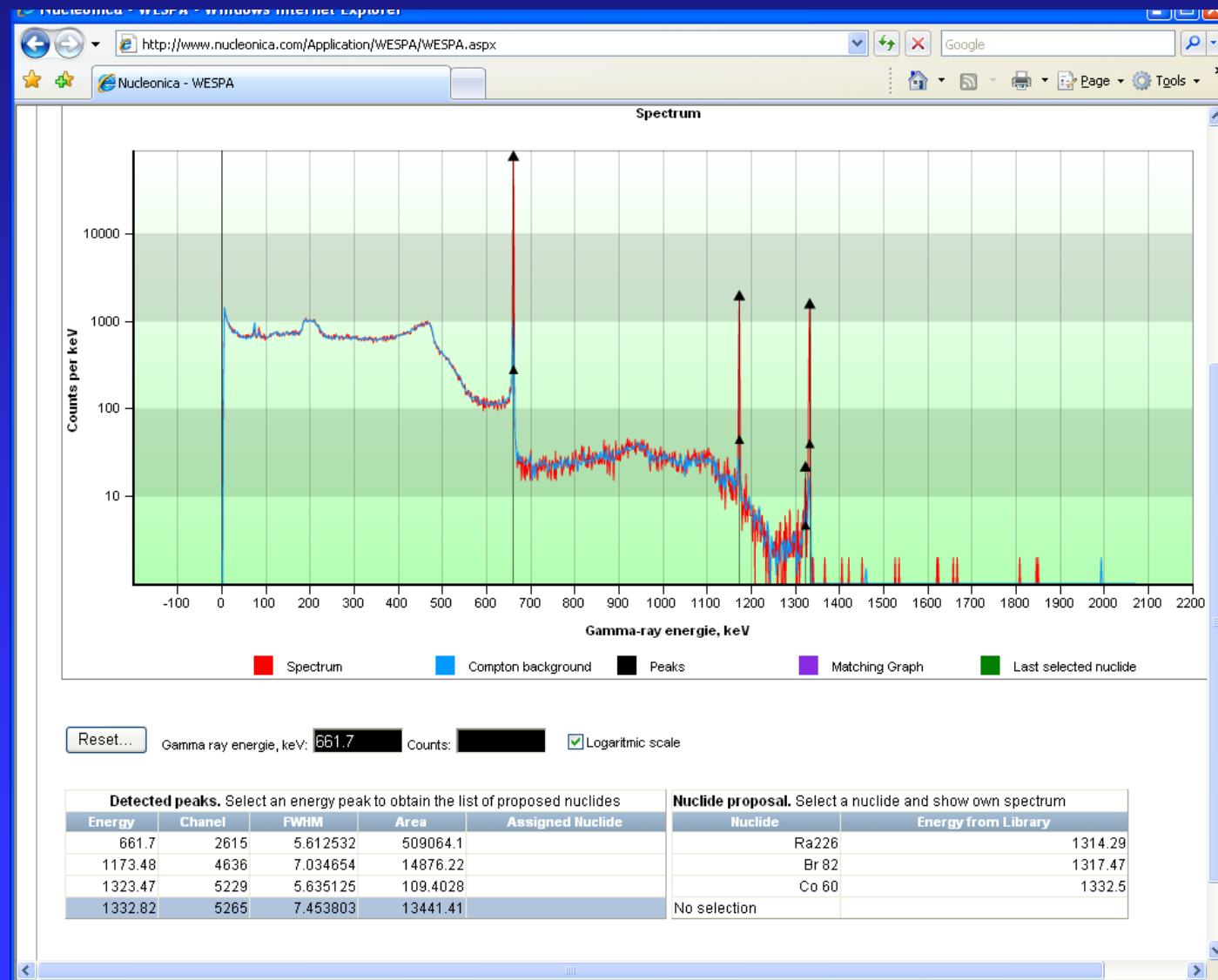
Energy resolution (FWHM) in keV at 122 keV: 0.8

Energy resolution (FWHM) in keV at 1332 keV: 1.8

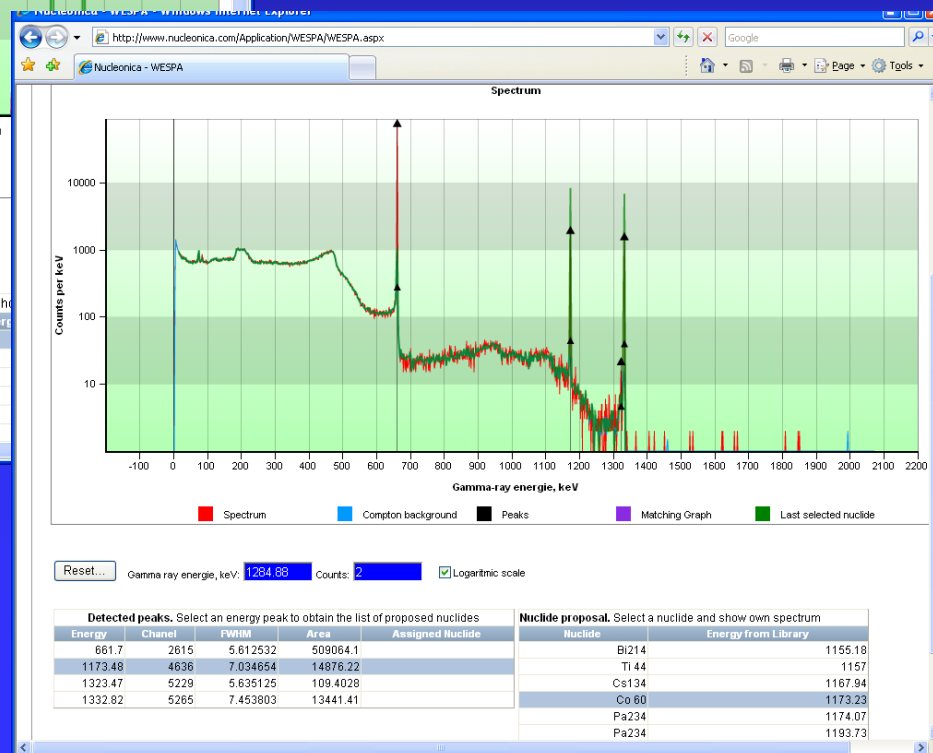
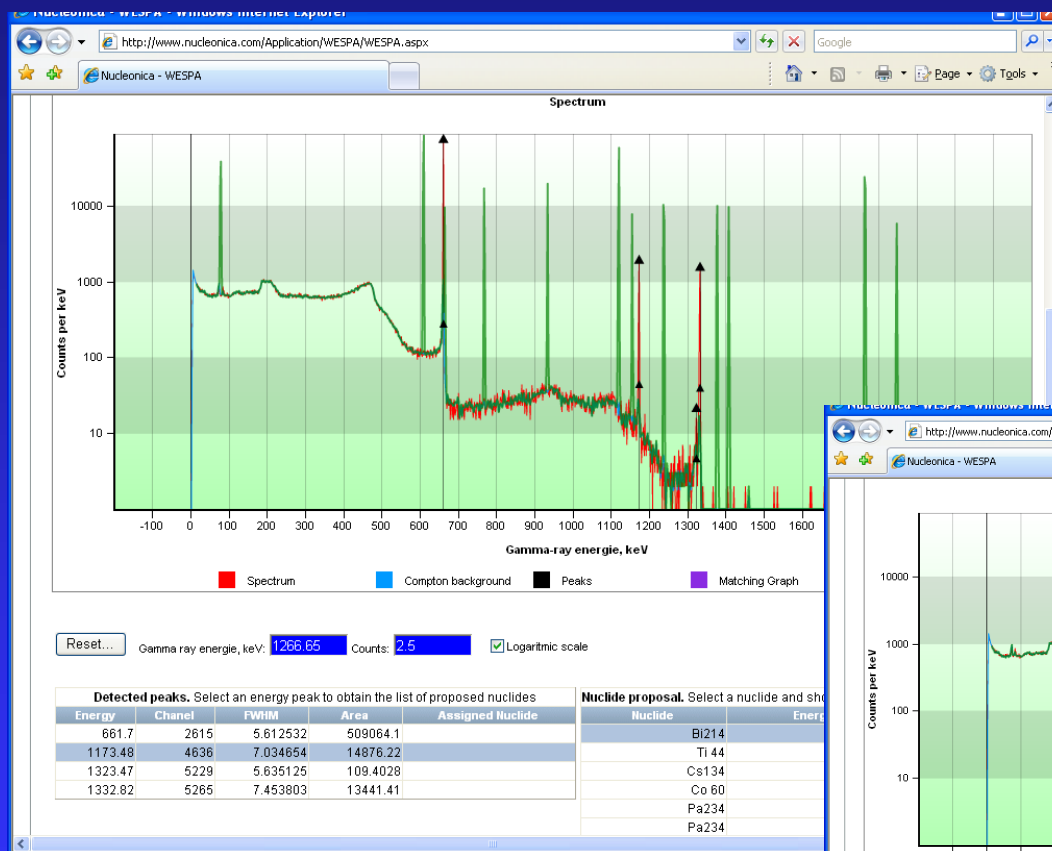
Assumed Accuracy: 10 %

Relative efficiency compared to 3"3" NaI: 42.01 %

WESPA: Analysis



WESPA: Peak fitting



GSG: Measurement setup

Nucleonica - Gamma Spectrum Generator - windows internet explorer

http://www.nucleonica.com/Application/Spectrum/Spectrum.aspx

Nucleonica - Gamma Spectrum Generator

Applications Data Knowledge My Preferences Print Help New Browser

Co60

10.47 m 5.27 y

Gamma Spectrum Generator

27 Cobalt

Actual chart: Karlsruhe

Getting started
Reference manual

Questions, remarks, suggestions
can be posted in the [forum](#)

Element: Co Mass: 60 Nuclide Mixtures Selector

Quantity: Bequerel 100000 Reference point: Measurement start

Measurement setup Calculation results Options

Measurement time: sec 1000 Start Start in background

Current configuration: HPGe, coaxial, p-type, rel. eff. 50% (default) Save as Delete

Dimensions in mm

Source

Filter

HPGe Crystal

Crystal diameter 59.0

Contact diameter 10.0

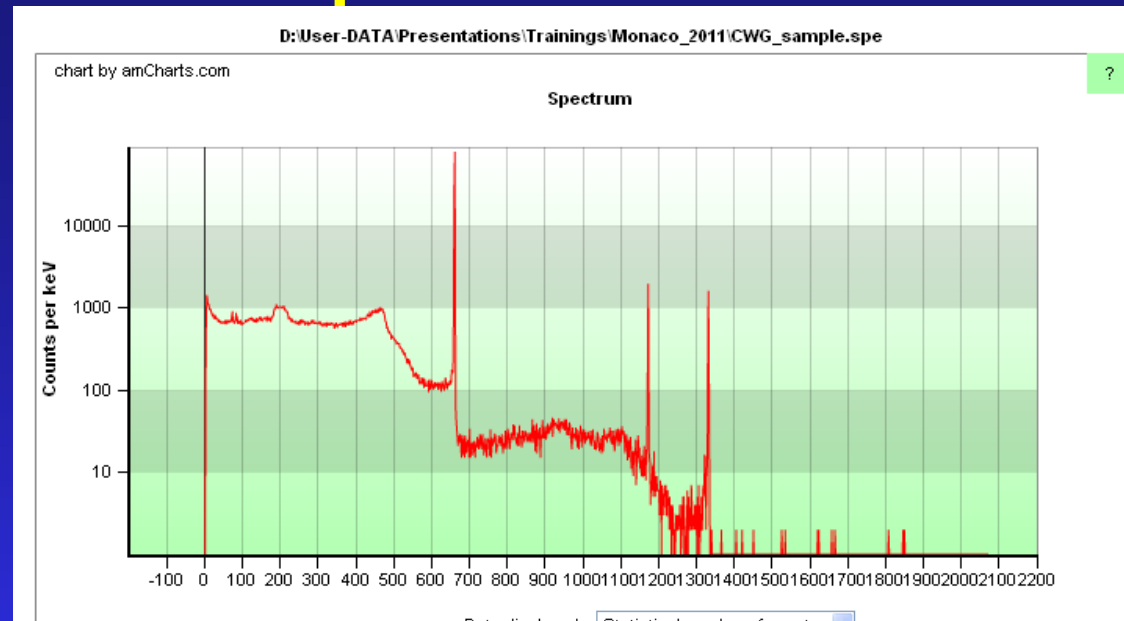
Contact length 45.0

Crystal length 70.0

Source to Detector distance 250.0

Show more settings

GSG: Spectrum modelling

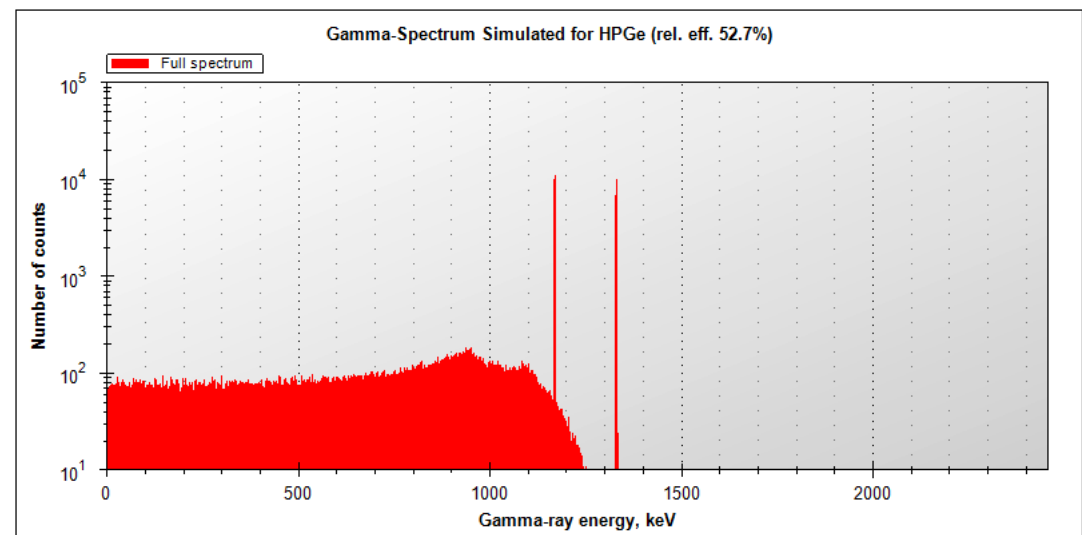
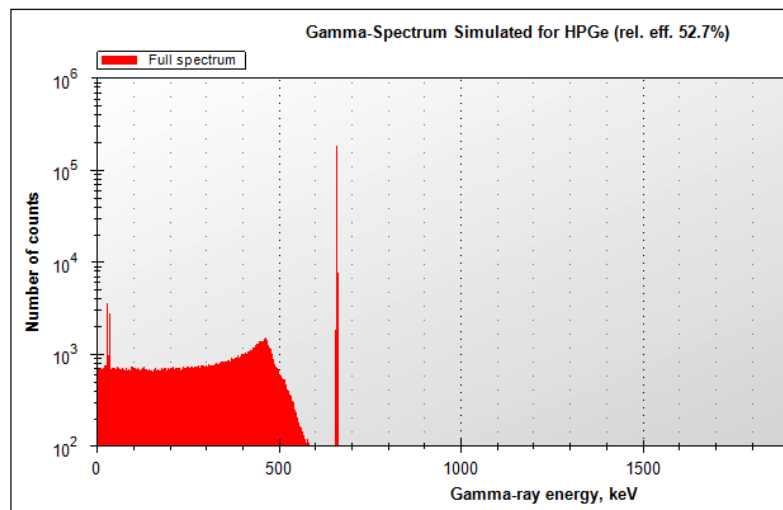


Data displayed: Statistical number of counts

View/Save results in [Text](#) format or as [IAEA-SPE](#) spectrum.

Data displayed: Statistical number of counts

View/Save results in [Text](#) format or as [IAEA-SPE](#) spectrum.



Update spectrum graph

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